The Weekly Expositor

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YALE, - - MICH

It will be noticed that Russia can see through her tears as far east as Vladivostock.

THE parties who stole Corbett's championship belt were doubtless skeptical about ever getting a chance at it in a regular way.

THE czar's physicians certify that he was not poisoned by nihilists. As soon as somebody certifies the same for the physicians the incident will be considered closed.

WHEN Mrs. W. K. Vanderbilt alleged non-support as the grounds for her divorce, she introduced a decided novelty among the skeletons in the closets of the 400.

OLIVER WENDELL HOLMES once said that the newspaper has become a necessity to the intelligent man of this country. It is this that makes it a good advertising medium.

THE difference between the modern novel and the advertisements seems to consist in the fact that the former is read by women, gossiped about, and then dismissed from their minds; while the latter is read, discussed, considered; after that the women march down and view the advertised goods and buy if they are able.

IF the torpedo boat Ericsson is liable to such accidents as have twice prevented her trial trip, a foreign foe could capture the Atlantic cities before the protector could be put into operation. One mean thing about foreign foes is that they will not postpone their attacks until the torpedo boat is in working order.

THAT boy who was fooled by the students of the Institute of Technology into standing on the Boston bridge in a storm for seven hours has the best of it after all. He has proved that he is sincere and game to the limit of his strength. The others have only proved that they are second-class idiots—and liars, also.

TOO EMPHATIC endorsement cannot be given to the action of the faculty of the university of Chicago touching the practice of hazing. The professors assert that the new rule prescribing the expulsion of all students who engage in disorderly demonstrations will be rigidly enforced. Prosecution in the police courts might be added.

All fears to the effect that the epidemic which has recently been raging in the various hospitals and kindred public institutions of Dublin was nothing more nor less than the dreaded Asiatic plague known as the Beri-Beri, have now been set at rest. For the doctors appointed to investigate the matter have come to the conclusion that the microbe responsible for all the evil is not that of the oriental Beri-Beri, but is indigenous to Dublin, and known by the name of "wiski-wiski."

LORD ROSEBERY says that all England wants is peace, and doubtless this is true. England has already as much territory as it can take care of, and there is no part of the world in which it could secure a considerable addition without coming in contact with some civilized power. It is hoped that universal peace will be maintained, and the understanding which it seems has been reached between England and Russia is a step in the direction of permanent peace.

WE take note that the people of Hamburg, including the whole imperial outfit in Berlin, continue to be much wrought up over the landing of a few American cattle alleged to be afflicted with Texas fever. We do not hear that anyone has suffered from eating this "diseased meat," so called, nor do we expect to, inasmuch as all the evidence goes to show that the alarm is not well founded. But the incident recalls the time of the cholera when Hamburg was sending us over a few cargoes of cholera patients, and her steamship lines had agents all over the empire scraping up more and offering them rates that placed a passage to New York within the reach of all.

ALREADY we hear of the czar's having banished a number of people to Siberia for plotting against the life of his father. We need not question the banishment, for that will continue, but we may be sure that such acts are not due to the deliberate volition of the Russian emperor. He is as much a tool and puppet in the hands of his counselors as if he were a mechanical automaton worked by wires. If our wrath should be stirred by acts of the czar our anger should not be turned against an irresponsible creature wearing a crown but against that gang of barbarians who for more than a century have overshadowed the throne and been the actual rulers of Russia.

ITALY and the Indian territory have long been rivals in the brigandage business, but Italy still holds first place. A band of desperadoes organized like soldiers has raided and looted a town of 2,000 inhabitants. Even the Bill Cook gang have not been able to equal that record.

THE laws of Kentucky, it seems, do not forbid the marriage of children. Cassius M. Clay's bride is only 15 years of age, and Cassius is more than 80. One is in her first childhood and the other is in his second.

SIEGE OF LUCKNOW.

THERE CHRISTIAN MARTYRDOM WAS TRIED.

Dr. Talmage Uses the Heroisms of the Residency as the Subject of the First of His Sermons on His Travels Around the World.

BROOKLYN, Nov. 25, 1894.—Rev. Dr. Talmage to-day began his series of round the world sermons through the press, the first subject selected being Lucknow, India. The text chosen was: Deuteronomy 20:19: "When thou shalt besiege a city a long time in making war against it to take it, thou shalt not destroy the trees thereof by forcing an ax against them.

The awfulest thing in war is besiegement, for to the work of deadly weapons it adds hunger and starvation and plague. Besiegement is sometimes necessary, but my text commands mercy even in that. The fruit trees must be spared because they afford food for man. "Thou shalt not destroy the trees thereof by forcing an ax against them." But in my recent journey round the world I found at Lucknow, India, the remains of the most merciless besiegement of the ages, and I proceed to tell you that story for four great reasons: to show you what a horrid thing war is and to make you all advocates for peace: to show you what genuine Christian character is under bombardment: to put a coronation on Christian courage: and to show you how splendidly good people die.

As our train glided into the dimly lighted station, I asked the guard, "Is this Lucknow?" and he answered, "Lucknow;" at the pronunciation of which proper name strong emotions rushed through body, mind and soul.

The word is a synonym of suffering, of cruelty, of heroism, of horror such as is suggested by hardly any other word. We have for thirty-five years been reading of the agonies there endured and the daring deeds there witnessed. It was my great desire to have some one who had witnessed the scenes transacted in Lucknow in 1857 conduct us over the place. We found just the man. He was a young soldier at the time the greatest mutiny of the ages broke out, and he was put with others inside the Residency, which was a cluster of buildings making a fortress in which the representatives of the English government lived, and which was to be the scene of an endurance and a bombardment the story of which, poetry, and painting, and history, and secular and sacred eloquence have been trying to depict. Our escort not only had a good memory of what had happened, but had talent enough to rehearse the tragedy.

In the early part of 1857 all over India the natives were ready to break out in rebellion against all foreigners, and especially against the civil and military representatives of the English government.

A half dozen causes are mentioned for the feeling of discontent and insurrection that was evidenced throughout India. The most of these causes were mere pretexts. Greased cartridges were no doubt an exasperation. The grease ordered by the English government to be used on these cartridges was taken from cows or pigs, and grease to the Hindoos is unclean, and to bite these cartridges at the loading of the guns would be an offense to the Hindoos' religion. The leaders of the Hindoos said that these greased cartridges were only part of an attempt by the English government to make the natives give up their religion; hence unbounded indignation was aroused.

Another cause of the mutiny was that another large province of India had been annexed to the British empire, and thousands of officials in the employ of the king of that province were thrown out of position, and they were all ready for trouble making.

Another cause was said to be the bad government exercised by some English officials in India.

The simple fact was that the natives of India are a conquered race, and the English were the conquerors. For 100 years the English sceptre had been waved over India, and the Indians wanted to break that sceptre. There never had been any love or sympathy between the natives of India and the Europeans; there is none now.

Before the time of the great mutiny the English government risked much power in the hands of the natives. Too many of them manned the forts. Too many of them were in governmental employ. And now the time had come for a wide outbreak. The natives had persuaded themselves that they could send the English government flying, and to accomplish it dagger, and sword, and firearms, and mutilation, and slaughter must do their worst.

It was evident in Lucknow that the natives were about to rise and put to death all the Europeans they could lay their hands on, and into the Residency the Christian population of Lucknow hastened for defense from the tigers in human form which were growling for their victims. The occupants of the Residency or fort were military and non-combatants, men, women and children, in number about 1,692. I suggest in one sentence some of the chief woes to which they were subjected, when I say that these people were in the Residency five months without a single change of clothing, some of the time the heat at 120 and 130 degrees, the place black with flies and all a-squirm with vermin, firing of the enemy upon them ceasing neither day nor night, the hospital crowded with the dying, smallpox, scurvy, cholera adding their work to that of shot and shell; women brought up in all comfort and never having known want crowded and sacrificed in a cellar where nine children were born; less and less food; no water except that which was brought from a well under the enemy's fire, so that the water obtained was at the price of blood; the stench of the dead horses added to the effluvia of corpses, and all waiting for the moment when the army of 60,000 shrieking Hindoo devils should break in upon the garrison of the Residency; now reduced by wounds and sickness and death to 976 men, women and children.

"Call me early," I said, "to-morrow morning, and let us be at the Residency before the sun becomes too hot." At 7 o'clock in the morning we left our hotel in Lucknow, and I said to our obliging, gentlemanly escort, "Please take us along the road by which Havelock and Outram came to the relief of the Residency." That was the way we went. There was a solemn stillness as we approached the gate of the Residency. Battered and torn is the masonry of the entrance. Signature of shot, and punctuation of cannon ball, all up and down and everywhere. "Here to the left," said our escort, "are the remains of a building the first floor of which in other days had been used as a banqueting hall, but then was used as a hospital. At this part the amputations took place, and all such patients died. The heat was so great and the food so insufficient that the poor fellows could not recover from the loss of blood; they all died. Amputations were performed without chloroform. All the anæsthetics were exhausted. A fracture that in other climates and under other circumstances would have come to easy convalescence, here proved fatal. Yonder was Dr. Fayrer's house, who was surgeon of the place, and is now Queen Victoria's doctor. This upper room was the officers' room, and there Sir Henry Lawrence, our dear commander, was wounded. While he sat there a shell struck the room, and some one suggested that he had better leave the room, but he smiled and said, 'Lightning never struck twice in the same place.' Hardly had he said this when another shell tore off his thigh, and he was carried dying into Dr. Fayrer's house on the other side of the road. Sir Henry Lawrence had been in poor health for a long time before the mutiny. He had been in the Indian service for years and he had started for England to recover his health, but getting as far as Bombay, the English government requested him to remain at least for a while, for he could not be spared in such dangerous times. He came here to Lucknow, and foreseeing the siege of this Residency had filled many of the rooms with grain, without which the Residency would have been obliged to surrender. There were also taken by him into this Residency rice, and sugar, and charcoal, and fodder for the oxen and hay for the horses. But now, at the time when all the people were looking to him for wisdom and courage, Sir Henry is dying." Our escort describes the scene, unique, tender, beautiful and overpowering, and while I stood on the very spot where the sighs and groans of the besieged, and lacerated, and broken-hearted met the whizz of bullets and the demoniac hiss of bursting shell, and the roar of batteries, my escort gave me the particulars.

As soon as Sir Henry was told that he had not many hours to live he asked the chaplain to administer to him the holy communion. He felt particularly anxious for the safety of the women in the Residency who, at any moment, might be subjected to the savages who howled around the Residency, their breaking in only a matter of time, unless reinforcements should come. He would frequently say to those who surrounded his death couch, 'Save the ladies. God held the poor women and children!' He gave directions for the desperate defense of the place. He asked forgiveness of all those whom he might unintentionally have neglected or offended. He left a message for all his friends. He forgot not to give direction for the care of his favorite horse. He charged the officers, saying, 'By no means surrender. Make no treaty or compromise with the desperadoes. Die fighting.' He took charge of the asylum he had established for the children of soldiers. He gave directions for his burial, saying, 'No nonsense, no fuss. Let me be buried with the men.' He dictated his own epitaph, which I read above his tomb: 'Here lies Henry Lawrence, who tried to do his duty. May the Lord have mercy on his soul.' He said, 'I would like to have a passage of Scripture added to the words on my grave, such as: "To the Lord our God belong mercies and forgivenesses, though we have rebelled against him" —isn't it from Daniel? So as brave a man as England or India ever saw, expired. The soldiers lifted the cover from his face and kissed him before they carried him out. The chaplain offered a prayer. Then they removed the great hero amid the rattling hail of the guns and put him down among other soldiers buried at the same time." All of which I state for the benefit of those who would have us believe that the Christian religion is fit only for women in the eighties and children under seven. There was glory enough in that departure to halo Christendom.

"There," said our escort, "'Bob the Nailer' did the work." "Who was 'Bob the Nailer?'" "Oh, he was the African who sat at that point, and when any one of our men ventured across the road he would drop him by a rifle ball. Bob was a sure marksman. The only way to get across the road for water from the well was to wait until his gun flashed and then instantly cross before he had time to load. The only way we could get rid of him was by digging a mine under the house where he was hidden. When the house was blown up 'Bob the Nailer' went with it." I said to him, "Had you made up your minds what you and the other sufferers would do in case the fiends actually broke in?" "Oh, yes," said my escort, "we had it all planned, for the probability was every hour for nearly five months that they would break in. You must remember it was 1,600 against 60,000, and for the latter part of the time it was 900 against 60,000, and the Residency and the earthworks around it were not put up for such an attack. It was only from the mercy of God that we were not massacred soon after the besiegement. We were resolved not to allow ourselves to get into the hands of those desperadoes. You must remember that we and all the women had heard of the butchery at Cawnpore, and we knew what defeat meant. If unable to hold out any longer we would have blown ourselves up, and all gone out of life together."

"Show me," I said, "the rooms where the women and children staid during those awful months." Then we crossed over and went down into the cellar of the Residency. With a shudder of horror indescribable I entered the cellars where 622 women and children had been crowded until the whole floor was full. I knew the exact number, for I counted their names on the roll. As one of the ladies wrote in her diary—speaking of these women, she said: "They lay upon the floor fitting into each other like bits in a puzzle." Wives had obtained from their husbands the promise that the husbands would shoot them rather than let them fall into the hands of these desperadoes. The women within the Residency were kept on the smallest allowance that would maintain life. No opportunity of privacy. The death angel and the birth angel touched wings as they passed. Flies, mosquitoes, vermin in full possession of the place, and these women in momentary expectation that the enraged savages would rush upon them, in a violence of which club and sword, and torch, and throat cutting would be the milder forms.

Our escort told us again and again of the bravery of these women. They did not despair. They encouraged the soldiery. They waited on the wounded and dying in the hospital. They gave up their stockings for holders of grape shot. They solaced each other when their children died. When a husband or father felt such prayers of sympathy were offered as only women can offer. They endured without complaint. They prepared their own children for burial. They were inspiration for the men who stood at their posts fighting till they dropped.

Our escort told us that again and again news had come that Havelock and Outram were on the way to fetch these besieged ones out of their wretchedness. They had received a letter from Havelock rolled up in a quill and carried in the mouth of a disguised messenger, a letter telling them he was on the way, but the next news was that Havelock had been compelled to retreat. It was constant vacillation between hope and despair. But one day they heard the guns of relief sounding nearer and nearer. Yet all the houses of Lucknow were fortresses filled with armed miscreants, and every step of Havelock and his army was contested—firing from house tops; firing from windows; firing from doorways.

"Show us where they came in!" I exclaimed, for I knew that they did not enter through the gate of the Residency, that being banked up inside to keep the murderers out. "Here it is," answered the escort. "Here it is—the embrasure through which they came."

We walked up to the spot. It is now a broken down pile of bricks a dozen yards from the gate. Long grass now, but then a blood-spattered, bullet-scarred opening in the wall.

As we stood there, although the scene was thirty-seven years ago, I saw them come in; Havelock, pale and sick, but triumphant; and Outram, whom all the equestrian statues in Calcutta and Europe can not too grandly present.

"What then happened?" I said to my escort. "Eh," he said, "that is impossible to tell. The earth was removed from the gate and soon all the army of relief entered, and some of us laughed, and some cried, and some prayed and some danced. Highlanders so dust-covered and enough blood and wounds on their faces to make them unrecognizable, snatched the babes out of their mothers' arms and kissed them, and passed the babies along for other soldiers to kiss, and the wounded men crawled out of the hospital to join in the cheering, and it was wild jubilee, until the first excitement passed, the story of how many of the advancing army had been slain on the way began to have fearful effect, and the story of suffering that had been endured inside the fort, and the announcement to children that they were fatherless, and to wives that they were widows, submerged the shouts of joy with wailing of agony."

"But were you not embarrassed by the arrival of Havelock and 1,400 men who brought no food with them?" He answered, "Of course, we were put on smaller rations immediately in order that they might share with us, but we knew that the coming of this reinforcement would help us to hold the place until further relief should come. Had not this first relief arrived as it did, in a day or two at most, and perhaps at any hour, the besiegers would have broken in, and our end would have come. The Sepoys had dug six mines under the Residency and would soon have exploded all."

Five Years for Embezzlement.

Albert A. Cadwallader, who embezzled $40,000 from the Superior National bank in Superior, Wis., in 1893, has been sentenced to five years at hard labor in the Milwaukee house of correction. Cadwallader was president of the bank and formerly resided at Bryn Mawr, Pa.

University Students Elope.

Two young students at Champlin university, in Illinois, Robert P. Morse of Indianapolis and Miss Gertrude Bailey of Longview, Ill., have eloped and are now the talk of the town.

SCIENTIFIC MATTERS.

SOME USEFUL NEW INVENTIONS AND DISCOVERIES.

Spectroscopy and the Elements—New Methods for Sawing Stone—A Handy Storage Battery—Picture Gallery Reflectors.

Spectrum analysis in the hands of Dr. Huggins and Mr. Lockyer and others has taught us things of which the world little expected to be told. We have been enabled to measure the speed with which clouds of blazing hydrogen course across the surface of the sun; we have learned the pace—the fabulous pace—at which the most familiar stars have been for ages approaching to or receding from our planet, which as far as historical records go back, they have always delineated on the evening sky. We have received some information about the elementary atoms themselves. We have learned that each sort of atom, when heated, strikes upon the ether a vibration, or set of vibrations, whose rate is all its own; and that no one atom or combination of atoms, in producing its own spectrum, encroaches even to the extent of a single line upon the spectrum that is peculiar to its neighbor. We have learned that the elements which exist in the stars, and especially in the sun, are mainly those with which we are familiar upon earth. These are a few lines in excess to which we can give no terrestrial name; and there are still more puzzling gaps in our list. It is a great aggravation of the mystery which besets the question of the elements that, among the lines which are absent from the spectrum of the sun, those of nitrogen and oxygen stand first. Oxygen constitutes the largest portion of the solid and liquid substance of our planet, so far as we know it; and nitrogen is very far the predominant constituent of our atmosphere. If the earth is a detached bit whirled off the mass of the sun, as cosmogonists love to tell us, how comes it that in leaving the sun we cleaned him out so completely of his nitrogen and oxygen that not a trace of these gases remains behind to be discovered even by the sensitive vision of the spectroscope?

All these things the discovery of the spectrum analysis has added to our knowledge; but it has left us as ignorant as ever as to the nature of the capricious differences which separate the atoms from each other, or the cause to which those differences are due.—From Unsolved Problems of Science, by the Marquis of Salisbury, in The Popular Science Monthly.

Applications of Cellulose.

Prof. C. A. Silberad has described some of the recent applications of cellulose. Of these the best known is celluloid, which is made of a combination of camphor and pyroxyline. It may be obtained either by direct addition of pyroxyline to melted camphor, or by strongly compressing the two together, or, lastly, by dissolving the two in some common solvent, as ether-alcohol. The product is a translucent mass, which is worked between rollers, first in the cold, and then at a higher temperature. It is next subjected to hydraulic pressure at a temperature of about 60 degrees centigrade for twenty-four hours, and dried for several days at a moderate heat, after being cut into sheets of desired thickness. The substance is then quite homogeneous, and may be cut and turned in the cold or molded under pressure at a higher temperature. It is readily colored by pigments or dyes, which can be either mechanically mixed in a state of powder or dissolved with the camphor in the alcohol. Artificial tortoise shell is made by welding together alternate plates of differently tinted celluloids. Another application of cellulose is to the manufacture of vegetable parchment, or parchment paper.

If the cellulose be rapidly passed through moderately strong sulphuric acid and then well washed in water, it acquires properties very similar to those of parchment, instead of which it is extensively used. Another form of cellulose, the thiocarbonate, possesses a similar power of coagulation either on standing for a considerable period or on heating above 60 degrees or by the action of an acid. This coagulation forms a gelatinous mass which gradually shrinks but in such a manner as to form an exact miniature of the interior shape of the containing vessel. All the sulphur and alkali are found in the liquid which separates from the shrunken mass. In view of the inevitably failing supplies of ivory and the established success of the ebonite and celluloid manufacturers, this material is destined to attain great commercial importance. None of the materials required in its production are expensive; it is free both from the brittleness of ebonite and the inflammability of celluloid, while the readiness with which it can be obtained in any desired shape gives it a marked superiority over either of these products.

Military Telegraphy.

Recent accounts of military evolutions in Europe go to show that great progress is being made in the utilization of both the telegraph and the telephone, especially in cavalry work. During the late cavalry maneuvers in England the field telegraph accompanied the cavalry at a trot, the wire being laid as fast as the cavalry advanced. When the cavalry retired it was reeled up with equal rapidity. It is understood that this demonstration of the possibility of the telegraph wire being used with cavalry will lead to an extension of the scope of the telegraph organization in the British army.

In telephone work, an interesting experiment between Berlin and Potsdam is reported. A telephone line was laid on the march by two cavalry patrols, each consisting of an officer and two under officers. One patrol started from Berlin, the other from Potsdam, very early in the morning. Each patrol was furnished with a complete telephone set and a supply of reels, each of which contained about a mile of steel wire. The end of the wire was connected to the town circuits in Berlin and Potsdam respectively, and the reel was so fixed on a carrier that the wire could unroll as the cavalrymen rode along. A second man rode behind, and, catching the wire with a sort of fork on the end of his lance, by which it was made about half as long again, threw it into the upper branches of the trees lining the road. The officer went first and the two men running the wire were about thirty paces apart. When the first reel was emptied, they halted. The telephone was connected, and a horn blown to signal the starting point, from which an answering signal was sounded. After a talk over the wire the new reel was joined up, and the process continued. Midway between the cities the patrols met, the wires were joined together, and speech was found to be perfect. The order was then given to take up the circuit, and each patrol, reeling up all the way, worked back to its starting point. The laying of over thirty miles of wire took only four hours.

The French are also alive to the importance of the telephone in army maneuvering. Each regiment of French infantry is now supplied with two portable telephone instruments, between three and four miles of wire, carried on bobbins, by men, a light bamboo ladder and two forked poles. By the use of these appliances, communication is immediately established in billets between regimental and brigade headquarters, or from any of the outposts to the rear.

New Method for Sawing Stone.

Much attention is being directed to a material which has just been brought into prominence in England, under the name of "krushite," for the cutting of stone. Krushite is made in different degrees of fineness, and is used by quarry owners and builders in sawing and polishing granite, stone, marble and other hard materials, in lieu of sand. Its inventor claims that it will saw a block of granite at the rate of four inches in depth per hour, and hard gritstone at 9 inches in depth per hour. One ton of the material is claimed to be equal to 300 tons of the sharpest sand. The sizes already on the market vary between the finest emery powder and rape seed. It is without point or edges, free from rust, and will not stain; it is chilled to intense hardness without being brittle, and in action it rolls between the block and saw blade or rubber; hence it retains its spherical shape and cutting power. It is used in sand blast apparatus instead of sand, and is substituted for diamonds in boring and drilling. Unlike sand or emery, it does not become imbedded in the blade or rubber, but rolls backward and forward creating a crushing action on the blocks sawn. The wear and tear of the blade is said to be much lower than when sand is used. For some time the composition of krushite was kept a secret. It is now declared to be chilled metallic shot. The idea of using chilled shot for sawing hard stone is not new, and the method was tried in America several years ago. So that, although krushite is heralded as a new material, it is actually, while possibly an improvement, but a modification of an old adaptation. Krushrite is likely to take the place of emery and the diamond in quartz sawing. Emery is largely used in the rubbing of granite and marble preparatory to the polishing process, and in sawing stones of the hardest kind, and diamond disks may be found in the workshops of every lapidary.

A Handy Storage Battery.

The importance of the storage battery in future electrical work is becoming daily more apparent. While in England and on the European continent it is extensively and successfully used, in America it has met with indifferent success. The trouble here seems to be that storage batteries are worked with too small a margin of safety; we want to get too much out of them. As W. W. Griscom recently put it: "A storage battery continually worked to its commercial rating is a commercial failure. A storage battery worked sufficiently within its capacity is invariably a commercial success." A battery is now made that, while 30 per cent lighter than other batteries of corresponding capacity, can be worked well within its capacity, and still give most satisfactory service. It is of unusual strength and solidity, and will stand any amount of hard usage. The lead plates are so assembled as to expose a very large amount of active service to the action of the electrolyte. The battery can be rapidly, economically, and efficiently charged. It may be both overcharged and discharged rapidly without detriment to the plates. In proof of his it is mentioned that a plant of these cells has been discharged repeatedly, for the last sixteen months, at rates of from one and one-half to four amperes per pound of plate and not a single plate of the batteries submitted to these severe tests was "buckled" or warped. The "buckling" or bending of the plates after a period of wear, has always been a fatal defect of the storage battery, and this new record is of value in showing a distinct stride in its construction. The new battery is well suited to the running of electric launches, lighting, or any service where a high discharge rate may be occasionally demanded, and it is claimed to be especially adapted for traction work.

An Excavator for River Banks.

An excavator has been patented for forming embankments along rivers, etc. The driving engine, which is placed on a flat-boat, is connected by gears and readily operated clutches with two drums, over which a rope passes, and is then carried out to a pulley in a framework on the bank. To the end of this rope the excavator is attached. As soon as it is placed in position for excavating, with its mouth in the embankment or heap to be removed, the windlass on the flat-boat is started, the rope is drawn taut, and the excavator, freighted with its load, is drawn upward and outward, and automatically dumped. The apparatus is supplied with two of these shovels or scrapers, and while one is being drawn up the embankment, the other is being returned to be filled. Thus the scrapers travel in opposite directions, and are alternately filled and emptied and returned to their place of starting.